Lecture 3 -Valuing Projects -Investment Decision Rules

1. **Capital Budgeting**
- Capital Investment Process *(E.g. purchase of new/ replacing manufacturing plant/ equipment)*
    (1) Generation of investment proposals
    (2) Estimation of cash flows for the proposals
    (3) Evaluation of the cash flows
    (4) Selection of projects based upon an acceptance criterion
    (5) Continual/ ongoing re-evaluation of investment projects after their acceptance
- Maximize the value of the firm

2. **Independent vs Mutually Exclusive Projects**

Independent	Mutually Exclusive
(1) It must be capable of being implemented **regardless of** whether any other project(S) is/are also accepted and implemented; and (2) Its cash flows must be **unaffected** by the acceptance or rejection of any other proposal	**Competing investment proposals** The acceptance of one project **precludes** the acceptance of any other project *E.g. alternative uses of piece of land; different types of equipment in manufacturing*

3. **Conventional vs Unconventional project**

Conventional	Unconventional
Only one sign change in cash flow	Many changes in sign

4. **Capital Rationing**
- Limits placed on the total funds available for investment (internal/ external):
    Ignores practical constraints (E.g. limited borrowing capacity)
- In this case, strict application of the NPV rules may be sub-optimal when selecting independent projects
    ➢ Decision: select the optimal combination of projects, given the restriction on available capital
    ➢ Use Profitability Index technique: the higher the PI →the more profitable the project

Payback method	Accounting rate of return (%)	Net Present Value			Internal rate of return (%)
The number of years it takes to recover the initial cash outlay	Average after tax profit/ initial cash outlay	- Value additivity principle - Discounted at the required rate of return/ company's cost of capital - Accept projects that have an NPV>0			Accept when an IRR > the opportunity cost of capital
		☺Considering of the time value and magnitude of cash flows ☺ The risk associated with particular projects			
	☹It uses accounting profits instead of cash flows - Cash flows differ from accounting earnings - Earnings figures are historical not prospective - Arbitrary measures used *(e.g. amortization)*	☹ Cannot deal with **projects with unequal lives** **Assumptions:** sales, costs, technology and operating efficiency **DO NOT** change with successive project replacements - Such changes may impact both cash flows and k - Too difficult to predict future technology and its impact on future cash flows - The discount factor decreases the further into time we go – the magnitude of any error deceases			☹ Cannot apply the value additivity principle (for firm value) ☹ **Conflicts:** - Problem of scale - Problems with "non-normal" (unconventional) cash flows → Multiple IRRs/ -ve. Or zero IRR: - If have "un-conventional" cash flows projects only NPV will provide the correct decision → relay on NPV decision rule - Implicit re-investment assumption: interim year cash flows are re-invested at ITT% for the remainder of the project →not realistic assumption
		Lowest Common Multiple (LCM)	**Constant Chain of Replacement (CCR)**	**Equivalent Annual Value (EAV)**	
		Assumption: when a project is finished →the company will implement a similar projects		Direct comparison of projects	
		Projects are repeated until the LCM of years is reached	Projects continues indefinitely	same result (ranking) as the CCR method → EAV is implicitly embedded within CCR	
		The "adjusted" project with **greatest total**	An **annuity** of $NPV paid at the beginning		